

Claims

1. Gas turbine blade (1) with a ceramic thermal insulation layer (17) that comprises 10 to 95 percent by weight magnesium aluminate (MgAl_2O_4), 5 to 90 percent by weight magnesium oxide (MgO), 0 to 20 percent by weight aluminum oxide (Al_2O_3) as well as a residue of ordinary impurities and is embedded in the granules (23) of magnesium oxide (MgO) with an average diameter of $0.1\text{ }\mu\text{m}$ to $10\text{ }\mu\text{m}$ in a matrix of spinel-shaped magnesium aluminate (MgAl_2O_4), whereby the ceramic thermal insulation layer (17) has a porosity exceeding 3 percent by volume.
2. Gas turbine blade (1) according to Claim 1, whereby the granules (23) have an average diameter of $0.1\text{ }\mu\text{m}$ to $2\text{ }\mu\text{m}$.
3. Gas turbine blade (1) according to Claim 1, whereby the thermal insulation layer (17) contains 55 to 80 percent by weight magnesium oxide (MgO).
4. Gas turbine blade (1) according to Claim 1, whereby the thermal insulation layer (17) also comprises at least one oxide from the group that contains CaO , SiO_2 , ZrO_2 and Fe_2O_3 .
5. Gas turbine blade (1) according to Claim 1, that has a basic body (15) of a nickel or cobalt base superalloy whereby the ceramic thermal insulation layer (17) is applied to the basic body (15) and whereby a first layer (31) is applied adjacent to the basic body (15), to which a second layer (33) differing from the first layer (31) has been applied.
6. Gas turbine blade (1) according to Claim 5, whereby the basic body (15) comprises a metallic corrosion protective layer (15A) applied to the superalloy.

7. Gas turbine blade (1) according to Claim 5, whereby the first layer (31) consists of 10 to 95 percent by weight magnesium aluminate (MgAl_2O_4), 5 to 90 percent by weight magnesium oxide (MgO), 0 to 20 percent by weight aluminum oxide (Al_2O_3) and the second layer (33) consists of yttrium oxide (Y_2O_3)-stabilized zirconium dioxide (ZrO_2).

8. Gas turbine blade (1) according to Claim 5, whereby the first layer (31) consists of yttrium oxide (Y_2O_3)-stabilized zirconium dioxide (ZrO_2) and the second layer (33) of 10 to 95 percent by weight magnesium aluminate (MgAl_2O_4), 5 to 90 percent by weight magnesium oxide (MgO) and 0 to 20 percent by weight aluminum oxide (Al_2O_3).

9. Gas turbine blade (1) according to Claim 5, whereby the first layer (31) and the second layer (33) consist of 10 to 95 percent by weight magnesium aluminate (MgAl_2O_4), 5 to 90 percent by weight magnesium oxide (MgO) and 0 to 20 percent by weight aluminum oxide (Al_2O_3), whereby the first layer (31) has a smaller porosity than the second layer (33).

10. Gas turbine blade (1) according to Claim 1, whereby the ceramic thermal insulation layer (17) is applied to a ceramic base layer (41) that has a porosity of less than 2 percent by volume.

11. Gas turbine blade (1) according to Claim 1, whereby the porosity in the ceramic thermal insulation layer (17) increases in increments towards the outside.